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IS 7138 (1973): Steel tubes for furniture purposes [MTD 19:  
Steel Tubes, Pipes and Fittings]



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“Knowledge is such a treasure which cannot be stolen”



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**IS : 7138 - 1973**  
**( Reaffirmed 1993 )**

*Indian Standard*  
**SPECIFICATION FOR**  
**STEEL TUBES FOR FURNITURE PURPOSES**

**( Fourth Reprint NOVEMBER 1997 )**

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**BUREAU OF INDIAN STANDARDS**  
**MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG**  
**NEW DELHI 110002**

# Indian Standard

## SPECIFICATION FOR STEEL TUBES FOR FURNITURE PURPOSES

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**IS : 7138 - 1973**

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AMENDMENT NO. 2    JULY 1983  
TO  
IS:7138-1973   SPECIFICATION FOR STEEL TUBES FOR  
FURNITURE PURPOSES

Alterations

(Page 3, clause 3.1) - Substitute the following  
for the existing clause:

"3.1 Steel for tubes shall be made by any of the approved process and shall show not more than 0.06 percent sulphur and not more than 0.06 percent phosphorus.

3.1.1 The analysis of steel shall be carried out either by the method specified in IS:228 'Methods for chemical analysis of steels' and its relevant parts or any other established instrumental/chemical method. In case of dispute the procedure given in IS:228 and its relevant parts shall be referee method. However, where the method is not given in IS:228 and its relevant parts, the referee method shall be agreed to between the purchaser and the manufacturer."

(Page 3, foot-notes with '\*' and '§' marks) - Delete.

(SMDC 22)

# *Indian Standard*

## SPECIFICATION FOR STEEL TUBES FOR FURNITURE PURPOSES

### 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 26 December 1973, after the draft finalized by the Steel Tubes, Pipes and Fittings Sectional Committee had been approved by the Structural and Metals Division Council.

**0.2** This standard has been prepared to assist the users and manufacturers in the supply of suitable quality furniture steel tubes. The standard is based on the existing manufacturing and trade practices in the country.

**0.3** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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### 1. SCOPE

**1.1** This standard covers the requirements for hot-finished, electric resistance or induction welded plain carbon steel tubes for furniture purposes.

### 2. SUPPLY OF MATERIAL

**2.1** General requirements relating to the supply of steel tubes for furniture purposes shall conform to IS : 1387-1967†.

### 3. MANUFACTURE

**3.1** Steel for tube shall be made by any of the approved process which when analysed in accordance with the methods specified in IS : 228-1959‡ and IS : 228 ( Part III )-1972§ shall show not more than 0.06 percent sulphur and not more than 0.06 percent phosphorus.

\*Rules for rounding off numerical values ( *Revised* ).

†General requirements for the supply of metallurgical materials ( *first revision* ).

‡Methods of chemical analysis of pig iron, cast iron and plain carbon and low-alloy steels ( *revised* ).

§Methods for chemical analysis of steels : Part III Determination of phosphorus ( Alkali-metric method ) ( *second revision* ).



## 4. DIMENSIONS

4.1 The standard sizes of tubes for furniture purposes shall be as given in Table 1.

TABLE 1 STANDARD SIZES OF FURNITURE TUBES

OUTSIDE DIAMETER mm	WALL THICKNESS mm
13.5	1.0, 1.2
16	1.0, 1.2
17.2	1.0, 1.2, 1.6
19	1.0, 1.2, 1.6
20	1.0, 1.2, 1.6
21.3	1.0, 1.2, 1.6
25	1.0, 1.2, 1.6, 2.0
26.9	1.0, 1.2, 1.6, 2.0
30	1.0, 1.2, 1.6, 2.0
31.8	1.0, 1.2, 1.6, 2.0
33.7	1.0, 1.2, 1.6, 2.0
38	1.0, 1.2, 1.6, 2.0
42.4	1.0, 1.2, 1.6, 2.0
44.5	1.0, 1.2, 1.6, 2.0
48.3	1.0, 1.2, 1.6, 2.0
51	1.0, 1.2, 1.6, 2.0

4.1.1 Tube sizes other than those given in Table 1 may be supplied as agreed to between the purchaser and the manufacturer.

4.2 Tolerances — The following tolerances shall apply:

a) <i>Outside Diameter</i>	<i>Permissible Deviation</i>
Up to and including 21.3 mm	$\pm 0.2$ mm
Above 21.3 mm	$\pm 0.3$ mm
b) <i>Wall Thickness (for All Sizes)</i>	+ not limited — 8 percent
c) <i>Weight</i>	
For single tube and for quantities less than 150 m of one size.	+ 10 percent — 8 percent
For quantities of 150 m and over of one size	$\pm 4$ percent

**AMENDMENT NO. 1      NOVEMBER 1975**  
**TO**  
**IS : 7138-1973 SPECIFICATION FOR STEEL TUBES**  
**FOR FURNITURE PURPOSES**

**Addenda**

( *Page 4, Table 1* ) — Add the following additional sizes under 'Outside Diameter' and 'Wall Thickness' at the appropriate places in the respective columns.

OUTSIDE DIAMETER	WALL THICKNESS
mm	mm
12.7	1.0, 1.2, 1.6, 2.0
22.0	1.0, 1.2, 1.6, 2.0
28.5	1.0, 1.2, 1.6, 2.0

( *Page 7, clause 11.2* ) — Add the following clauses after 11.2:

**12. MARKING**

**12.1** Each tube shall have the name and trade-mark of the manufacturer.

**12.2** The tube may also be marked with the Standard Mark.

**12.2.1** The use of the Standard Mark is governed by the provisions of Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

( SMDC 22 )

## 5. WORKMANSHIP

5.1 The tubes shall be clean and free from scale. They shall be free from cracks, laminations and other defects.

5.2 The height of the internal fin shall not be greater than 60 percent of the specified wall thickness.

5.3 The cut ends of the tube shall be free from burr.

## 6. HEAT TREATMENT

6.1 The tubes shall be supplied as welded or in heat-treated condition with the external fin removed.

## 7. STRAIGHTNESS

7.1 Tubes shall be straight to sight.

## 8. LENGTHS

8.1 The tubes shall normally be supplied in random mill lengths of 4 to 7 metres and the length tolerance shall be  $\pm 0.15$  m.

8.2 If exact lengths are ordered, the tubes shall be recut to the specified length and the tolerance on cut length shall be as given below:

For tubes up to 3 m long	+ 6 mm — 0 mm
Over 3 m long	+ 10 mm — 0 mm

## 9. MECHANICAL TESTS

9.1 **Tensile Test** — The tensile strength, yield stress and elongation shall be determined in accordance with the methods specified in IS : 1894-1962\* and the values shall be as specified below:

Tensile strength	320 N/mm <sup>2</sup> , <i>Min</i>
Yield strength	210 N/mm <sup>2</sup> , <i>Min</i>
Elongation	Not less than 20 percent on a gauge length of $5.65 \sqrt{S_0}$ , where $S_0$ is the original cross-sectional area of the test specimen

**NOTE** —  $1 \text{ kgf/mm}^2 = 9.81 \text{ N/mm}^2$ .

\*Method for tensile testing of steel tubes.

**9.1.1** The tensile and elongation tests shall be made on:

- a) a length cut from the end of the selected tube ( the ends of the length being plugged for grips, where necessary ); or
- b) a longitudinal strip cut from the tube, not including the weld, and tested in the curved condition.

**9.2 Bend Test** — When tested in accordance with IS : 2329-1963\* the finished tubes shall be capable of withstanding the bend test without showing any signs of crack or failure. The tubes shall be bent cold through 180° round a former having a radius at the bottom of the groove equal to six times the outside diameter of the tube.

**9.2.1** Tubes shall be bent with the weld at 90° to the plane of bending. Tubes shall not be filled for this test.

**9.3** One of the following tests shall be done as agreed to between the purchaser and the manufacturer.

**9.3.1 Drift Test** — The test shall be carried out in accordance with IS : 2335-1963†. A piece of tube approximately 100 mm long, cut from one end, shall be expanded by means of a conical drift having an included angle of 30°, until the internal diameter of the tube at the mouth has been increased by not less than 7.5 percent. The tubes shall show no sign of crack or flaw as a result of this test.

**9.3.2 Flattening Test** — Flattening test shall be carried out in accordance with IS : 2328-1963‡.

**9.3.2.1** A ring not less than 40 mm in length, cut from the end of the tube shall withstand without showing either crack or flaw, being cold-flattened between parallel plates until, when the pressure is released, the interior surfaces of the test piece at the middle remain apart at a distance not greater than five times the wall thickness of the tube. Weld line shall be placed at 90° to the direction of flattening.

## **10. RETESTS**

**10.1** Should any one of the test pieces first selected fail to pass any of the tests specified, two further samples shall be selected for testing in respect of each failure from the same lot. Should the test pieces from both these additional samples pass, the material represented by the test samples shall be deemed to comply with the requirement of that particular test. Should the test pieces from either of these additional samples fail, the material represented by the test samples shall be deemed as not complying with the standard.

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\*Method for bend test on steel tubes.

†Method for drift expanding test on steel tubes.

‡Method for flattening test on steel tubes.

## **11. PROTECTION AND PACKING**

**11.1** Tubes shall, unless otherwise specified, be oiled externally and internally using a suitable rust preventive oil.

**11.2** Where tubes are to be bundled for transport, they shall, unless otherwise specified, be packed in accordance with IS : 4740-1968\*.

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\*Code of practice for packaging of steel tubes.

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